

Testimony of Jim Hall Former Chairman, National Transportation Safety Board

October 31, 2007

Good Afternoon Mr. Chairman and Members of the Committee:

Thank you for allowing me the opportunity today to speak on the subject of *Aviation Safety: Can NASA Do More to Protect the Public?* My name is Jim Hall, and for more than seven years I served as Chairman of the National Transportation Safety Board (NTSB). I also had the honor to serve as a Commissioner on the 1996 White House Commission on Aviation Safety and Security.

As you know, the NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States as well as significant accidents in the other modes of transportation -- railroad, highway, marine, and pipeline. Since its inception in 1967, the NTSB has investigated more than 124,000 aviation accidents and over 10,000 surface transportation accidents, and has also assisted many foreign governments with their own investigations. In its issuance of more than 12,000 recommendations in all transportation modes to more than 2,200 recipients, the Board has established a solid reputation for diligence and impartiality. From 1994 to 2001, I headed this organization that serves as the “eyes and ears” of the American people at aviation and other transportation accidents across the country and around the world. Now, as a transportation safety and security consultant, I continue my commitment to promoting safety in our nation’s transportation system.

Today I would like to put the current aviation safety environment in a historical context. Ten years ago we were confronted with a special situation of change and risk in the aviation industry. In response, the Commission on Aviation Safety and Security was formed, which I will discuss in a moment. I believe that today we face a similar situation, what I like to call “the next generation of risks.”

The Gore Commission

In 1996, the federal government initiated a decade-long overhaul of aviation safety that began with the establishment of the White House Commission on Aviation Safety and Security, headed by Vice President Al Gore. The Gore Commission, as it would come to be called, was formed for three major reasons.

On May 11, 1996, ValuJet flight 592 crashed in the Everglades after an in-flight fire caused by transported oxygen canisters, killing all 110 people on board. In the resulting NTSB investigation, we found airline contractors and ValuJet – an airline that had been formed just three years prior to the flight 592 crash – negligent in several areas, including oversight and mishandling of hazardous materials. We also determined if previous recommendations issued in 1988 regarding fire detection and extinguishing systems had been adopted, flight 592 would likely not have crashed. It was, therefore, a largely preventable and tragic loss of life.

The second major reason for the formation of the Gore Commission was an incident occurring only two months after the ValuJet crash. On July 17, 1996, Trans World Airlines Flight 800 experienced an in-flight break up following an explosion of the center wing fuel tank (CWT) shortly after take off from John F. Kennedy Airport in New York City, killing all 230 people on board. After an extensive 17-month investigation we determined the source of the explosion to be an ignition of the flammable fuel/air mixture in the tank, an ignition most likely caused by a short circuit outside of the fuel tank. The NTSB issued specific recommendations on wiring and design as well as broader management of the aging aircraft fleet. In the period immediately following the crash, concerns of possible security problems led President Clinton to call for an immediate report on aviation security within 45 days.

The third reason that led to the Gore Commission was the general feeling that aviation – an industry that generated \$300 billion annually and employed close to one million Americans – was undergoing profound changes. In the ten years prior to 1996, the Federal Aviation Administration (FAA) had certified twenty new aircraft models and the number of passengers flying in the United States exceeded more than a half billion. New digital technology was being developed to improve communication and navigation. Sixty new airlines, such as ValuJet, had started operations since 1992. The commercial airline fleet was both quickly aging and in the midst of rapid replacement of aircraft. The domestic market faced the possibility of increased competition from foreign carriers. To add to this, the FAA predicted that by 2007, more than 800 million passengers would fly in the United States.

In this setting, and in light of two very public and tragic accidents, the Gore Commission was created with three specific mandates: to examine security threats and ways to address them; to analyze overall changes in the industry and the appropriate adaptation of government regulation to these changes; and to look at technological changes in the air traffic control system. All of us involved at the time felt that we needed to “get ahead” of events in a rapidly changing environment, to improve the safety and security of aviation before – not after – another tragic accident occurred.

Over six months I and the fellow members of the commission – which included the Secretary of Transportation, two retired Air Force generals, the director of FBI, and several scientists – conducted dozens of site visits in the U.S. and abroad, held six public meetings, and co-sponsored an International Conference on Aviation Safety and Security attended by over 700 representatives from sixty-one countries. From our findings we issued some fifty-one separate recommendations covering a variety of issues from safety to security to the notification of family members following an incident.

Notable safety recommendations issued by the Commission included: the establishment of standards for continuous safety improvement (a target rate of 80% was set for the reduction of fatal accidents); extension of FAA oversight to aviation contractors; the simplification of Federal Aviation Regulations; an emphasis on human factor safety research and training; and an extension of whistleblower statutory protection to the aviation industry. To be sure, not every recommendation made was subsequently enacted, nor was every possible safety item individually addressed – no commission can claim perfection in this respect. Nevertheless, many recommendations were in fact adopted and perhaps even more significantly, the Presidential

attention shown to the issue sent a message to both government and industry leaders that the establishment of a safety culture was not an option. It is therefore no coincidence that in the ten year period following the commission, the industry successfully reduced fatal accidents by 65 percent, 15 percent shy of the national goal, but noteworthy nonetheless.

This reduction was due not only to the actions of the airlines but to government efforts as well. The Commission charged the FAA, Department of Transportation (DOT), and NTSB to be more vigorous in their certification, regulation, and investigative functions. It also urged the expansion of research, and specifically noted the need for the National Aeronautics and Space Administration (NASA), “which has considerable expertise and resources in the area of safety research, to expand its involvement in the promotion of aviation safety.”

As a result of the Commission’s recommendation, NASA launched its \$500 million Aviation Safety Program (AvSP) a partnership with the Department of Defense (DoD), FAA, and the aviation industry to focus on accident prevention, accident mitigation, and aviation system monitoring and modeling. It is this last point, the extremely important safety research function, which brings us here today. Given a rapidly changing environment and a new set of risks, the attempt on the part of NASA to suppress safety data is a grave and dangerous challenge to the safety culture that has developed over the last century of aviation history, due to lessons learned from past accidents and incidents.

The Next Generation of Risks

The 65% reduction in fatal accidents over the past ten years is certainly welcome news, but while many advances have been made, there are dangerous trends in the aviation industry that stand to jeopardize this progress.

We are currently in the middle of an air traffic controller staffing crisis. Fueled in part by the lack of a contract, this crisis has industry-wide consequences including: more and longer flight delays, combined radar and tower control positions, and an increased use of mandatory overtime resulting in an exhausted, stressed out, and burned out workforce. According to the National Air Traffic Controller Association (NATCA) there were 856 retirements in fiscal year 2007, (7.4 percent of the total experienced controller workforce), leaving the country with a 15-year low in the number of fully certified controllers and a surplus of new hires – many with no air traffic control experience or education. Total controller attrition in FY07 was 1,558, nearly wiping out any net gains in total staffing made by the FAA’s hiring efforts. In fact, the agency estimates it will lose about 70 percent of the air traffic controller workforce over the next 10 years.

Air Traffic Controllers are not the only ones retiring. Pilot staffing levels are dangerously low as a result of retiring baby boomers and an explosion of new airlines and increased airline fleets in Asia and the Middle East, raising similar concerns of an influx of inexperienced and insufficiently trained pilots. In 2009, airlines will have to fill 20,000 openings due to retirements and other factors. Some airlines facing pilot shortages are lowering experience requirements to the FAA minimum.

Other operational and technological areas present potentially problematic trends as well. Runway incursions, which have been on the NTSB's Most Wanted Safety Improvement list since 2001, totaled over 1,300 between fiscal years 2003 and 2006. Among the aviation safety community, the Tenerife incursion accident that killed 583 people in the Canary Islands in 1977 stands as a sober reminder of the importance of getting this number down. The April 25, 2006 crash of an unmanned aerial vehicle (UAV) in Nogales, Arizona, and the resulting NTSB investigation and 22 recommendations illustrate the potential problems with the growing expansion of drone flights in the U.S. General aviation and the air ambulance fleet have also increased in the last ten years; however the FAA does not collect actual flight activity data for general aviation operators and air taxis, instead using an annual survey to query a sample of registered aircraft owners.

Several new aircraft types will emerge in the years ahead, ranging from the jumbo Airbus A380 that seats more than 500 passengers – a jet so large as to raise safety concerns in its own right – to very light jets that might transport six or fewer passengers. As many as four to five hundred new very light jets are scheduled to be introduced into American airspace each year starting in 2008.

The Next Generation Air Transportation System (NexGen), a major and much-needed technology upgrade for the air traffic control system scheduled for completion in 2025, will only add to the variables that need to be factored in aviation safety, especially if NexGen is not adequately funded, implemented, or regulated.

Overshadowing all these developments is a major growth in demand for air travel. In fiscal year 2006, over 740 million passengers flew in American skies. That figure is projected to reach 1 billion by 2015 and close to 2.3 billion by 2027. These numbers are absolutely staggering. On January 1, 2007 federal regulations on the quantity of planes able to use J.F.K. airport ended, and traffic has increased by some 20 percent. Congestion and resulting delays may be inconvenient, but it also increases the potential for mishaps. As a Government Accounting Office (GAO) report released in February of this year noted, “although the system remains extraordinarily safe, if the current accident rate continues while air traffic potentially triples in the next 20 years, this country would see nine fatal commercial accidents each year, on average.”

I am not suggesting that nothing is being done to address these issues. I think individuals such as Marion Blakely, former administrator of the FAA, and Bobby Sturgell, current Acting Administrator of the FAA, have taken strong steps to address safety concerns. And yet, to again cite the GAO study, “FAA’s approaches to safety require that the agency obtain accurate and complete data to monitor safety trends, fully implement its safety programs, and assess their effectiveness to determine if they are focused on the greatest safety risk. FAA has made progress in this area *but more work remains* [italics added].”

The Withholding of NASA’s Data

More work indeed remains, which makes it all the more frustrating that NASA withheld results obtained from an \$8.5 million tax payer funded national survey of almost 24,000 pilots. This survey reportedly states that runway incursions, wildlife strikes, and near collisions occur at a

rate at least twice as much as is commonly thought. As justification to its denial of a Freedom of Information Act request, NASA cited the potentially harmful affects on the commercial welfare of the air carriers and general aviation companies.

Such an action runs exactly counter to the safety culture mentality the government and industry have worked to create over the past ten years. As the GAO observed, transparency forms the fundamental basis for any safety program. If we don't know something is broken, we cannot fix it. If we do not know that runway incursions are actually occurring at a much higher level, then we cannot take steps and assign the resources to deal with them.

It is difficult to overemphasize the importance of transparency and accountability in aviation. It is the single greatest reason why you are so safe when you get on an airplane today. The history of transparency began with the Wright Brothers, who assisted in the investigation of the first fatal aviation accident and used the results to incorporate changes to their flying machine in order to save lives. In September 1908, five years after the Wrights' historic flight, Orville and Lt. Thomas Selfridge were conducting an aerial demonstration for the Army in Fort Meyers, Virginia when their airplane stopped responding to controls and crashed, injuring Orville and killing Lt. Selfridge. The Wright Brothers' commitment to objective scrutiny and constant improvement set an historic precedent and has led to a safety culture in aviation that is built on fact finding, analysis and open sharing of information to advance aviation and save lives. This open process has resulted in numerous important advances in aviation. In the modern era, NTSB investigations and recommendations have led to smoke detectors in airplane lavatories, floor level lighting strips to lead passengers to emergency exits, anti-collision systems, and ground proximity warning devices, to name but a few.

The industry often very clearly responds to the efforts of safety research even before investigations are completed. On September 8, 1994, USAir flight 427, a Boeing 737, crashed while on approach to Pittsburgh, Pennsylvania. After 80,000 hours of investigation, the NTSB had not yet completed its final report but had issued several recommendations. In response, Boeing and the FAA began developing and certifying several modifications to the 737 main rudder power control unit (PCU) servo valve. The FAA proposed an Airworthiness Directive to require the installation of newly designed PCUs within 2 years. Most airlines began providing training to pilots on the recognition, prevention, and recovery of aircraft attitudes normally not associated with air carrier flight operations.

On October 31, 1994, an American Eagle ATR-72 crashed in Roselawn, Indiana. Seven days after the crash of an ATR-72 in Roselawn, Indiana, we issued recommendations covering the operation of those aircraft in icing conditions. Thanks to a then state-of-the art flight recorder, we were able to learn within days that the French-built ATRs upset was initiated by a rapid deflection of the right aileron. The NTSB deduced that this deflection was caused by the accumulation of a substantial amount of ice on the wings during the 30 minutes the plane was in a holding pattern. Within a week of the accident, the NTSB issued urgent safety recommendations to the FAA to restrict the operation of ATRs in icing conditions until a fix could be developed to counteract the phenomenon the accident aircraft encountered. Within a month, following test flights in the United States and France, the FAA effectively grounded the aircraft in icing conditions. A redesign of the wing anti-icing boots was developed, and the

modified airplanes returned to the skies.

One of the keys to the Roselawn investigation was the fact that the flight data recorder (FDR) was recovered and that it recorded some 98 parameters, giving investigators ample information with which they could quickly establish the cause of the accident and the most appropriate fix. This contrasts with the FDR onboard flight 427 the previous month, which recorded only 11 parameters and in so small part delayed the release of the final investigation report by over four years. In a sense, NASA's refusal to release their safety data is tantamount to denying investigators access to black boxes. Both actions seriously impede the ability to determine potentially critical safety concerns.

Information flow is the key to safety, whether to the investigator actually assembling pieces on the ground or to the analyst compiling survey data back in the office. In its investigations into the two shuttle accidents in 1986 and 2003, NASA itself noted that a decline in transparency and accountability among management – and not simply a lack of adequate funding for safety - was a root cause of both incidents.

The investigation into the Challenger explosion specifically faulted management isolation and a failure to provide full and timely information. The final report of the Columbia Accident Investigation Board (CAIB) noted that for both the Columbia and Challenger accidents, “there were moments when management definitions of risk might have been reversed were it not for the many missing signals – an absence of trend analysis, imagery data not obtained, concerns not voiced, information overlooked or dropped from briefings.” The chairman of the CAIB, Retired Navy Admiral Harold Gehman pointed out that NASA tends to initially follow safety procedures quite well, but then loses its diligence as time progresses. Columbia investigation board member Air Force Major General John Barry stated that “there is still evidence of a silent safety program with echoes of Challenger.” Safety and silence are simply incompatible.

The culture of aviation safety has been built on constant critical self examination, in an open environment, with full sharing of all the facts and analysis. Because we are safer today than yesterday does not mean that we cannot be safer tomorrow. It also doesn't mean that our gains are not perishable. For example, on July 2, 1994 USAir flight 1016 crashed in Charlotte, North Carolina. We determined that the causal factor was something we hadn't seen in the United States in almost a decade: windshear. Windshear detection equipment and improved pilot training had all but eliminated this hazard and yet more sophisticated weather detection equipment -- Terminal Doppler Radar -- had fallen years behind schedule due to procurement and design problems.

Furthermore, because we have made major accidents such a rarity, our ability to identify risks, and maintain or increase safety now depends primarily on our ability to fully analyze incidents and trends. In the absence of a major fatality accident or without a complete picture of runway incursions, wildlife strikes, and near-misses, we may be lulled into a false sense of security – only to have that eventually broken by a catastrophic loss of life. A true safety culture requires transparency and constant vigilance.

This vigilance is required of all involved in the aviation industry, but its absence is perhaps most glaring when it is the fault of government, the servants of the American people. As chairman of

the NTSB, I followed the dictum of Benjamin Franklin, who said, "The man who does things makes many mistakes, but he never makes the biggest mistake of all – doing nothing." I never wanted the American people to think that, when a need was identified – as it was in any number of safety-sensitive issues – we did nothing. Let us then not shrink from action but rather call on NASA to release its information, the denial of which flies in the face of aviation history, responsible government, and common sense.

Conclusion

We are clearly facing a new generation of risks. New technology, new planes, personnel shortages, and a massive projected increase in air travel mean that new hazards are approaching. Before we push the panic button, however, we should remember that we have been in this situation before. In 1996, we projected an increase of 220 million passengers in the next ten years and identified a host of technological and operational concerns that would compound this development. In response the President formed a commission and its recommendations – though not perfect and not all implemented – contributed to a substantial reduction in fatal accidents. Today in 2007, we are forecasting an increase of 260 million passengers in the next eight years and an increase of 1.5 billion in the next twenty. We have personnel shortages looming or already underway and have committed ourselves to new technology. In fact the only major difference between 1996 and 2007 was 1996's dramatic and tragic loss of 340 lives in two accidents.

Congress, government agencies, and the aviation industry must once again come together to address the rapidly changing aviation environment. We must stay ahead of events instead of waiting for another crash. Steps must be taken to prevent a deterioration of our nation's aviation safety culture, a deterioration that NASA's denial of transparency plainly represents. In only such a manner can we adapt to a growing and diversifying industry with a rigid adherence and commitment to the safety of all who fly in our nation's airspace.